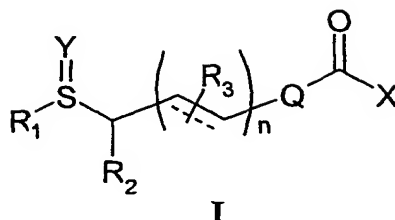


CLAIMS

1. A compound of general formula (I):



5 in which:

$R^1$  may be (C<sub>6</sub> or C<sub>10</sub>) aryl, (C<sub>6</sub> or C<sub>10</sub>) arylalkyl, (C<sub>6</sub> or C<sub>10</sub>) heteroaryl, (C<sub>3</sub>-C<sub>8</sub>) heterocycloalkenyl, (C<sub>5</sub>-C<sub>8</sub>) cycloalkene ring, (C<sub>5</sub>-C<sub>8</sub>) cycloalkyl, (C<sub>5</sub>-C<sub>8</sub>) heterocycloalkyl or a combination thereof to form a linked or fused ring system, the  
 10 cyclic moiety being optionally substituted with (C<sub>1</sub>-C<sub>10</sub>) alkyl, (C<sub>1</sub>-C<sub>10</sub>) alkenyl, (C<sub>1</sub>-C<sub>10</sub>) alkynyl, (C<sub>1</sub>-C<sub>10</sub>) alkoxy, (C<sub>1</sub>-C<sub>10</sub>) thioalkoxy, hydroxyl, hydroxyl, (C<sub>1</sub>-C<sub>10</sub>) hydroxylalkyl, halo, (C<sub>1</sub>-C<sub>10</sub>) haloalkyl, amino, amido, (C<sub>1</sub>-C<sub>10</sub>) alkylamino, (C<sub>1</sub>-C<sub>10</sub>) alkylcarbonyloxy, (C<sub>1</sub>-C<sub>10</sub>) alkoxycarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylcarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylthiocarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylsulfonylamino, aminosulfonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylsulfinyl,  
 15 or (C<sub>1</sub>-C<sub>10</sub>) alkylsulfonyl,

$R^2$  and  $R^3$  may each independently be hydrogen, (C<sub>1</sub>-C<sub>12</sub>) alkyl, substituted (C<sub>1</sub>-C<sub>12</sub>) alkyl, or unsaturated (C<sub>1</sub>-C<sub>12</sub>) comprising one or more C=C bond or C≡C bond, (C<sub>6</sub> or C<sub>10</sub>) aryl or (C<sub>6</sub> or C<sub>10</sub>) heteroaryl, or a combination thereof to form a linked or fused  
 20 ring system, or (C<sub>1</sub>-C<sub>10</sub>) alkyl, (C<sub>1</sub>-C<sub>10</sub>) alkenyl, (C<sub>1</sub>-C<sub>10</sub>) alkynyl, (C<sub>1</sub>-C<sub>10</sub>) alkoxy, (C<sub>1</sub>-C<sub>10</sub>) thioalkoxy, hydroxyl, hydroxyl, (C<sub>1</sub>-C<sub>10</sub>) hydroxylalkyl, halo, (C<sub>1</sub>-C<sub>10</sub>) haloalkyl, cyano, nitro, amino, amido, (C<sub>1</sub>-C<sub>10</sub>) alkylamino, (C<sub>1</sub>-C<sub>10</sub>) alkylcarbonyloxy, (C<sub>1</sub>-C<sub>10</sub>) alkoxycarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylcarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylthiocarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylsulfonylamino, aminosulfonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylsulfinyl,  
 25 or (C<sub>1</sub>-C<sub>10</sub>) alkylsulfonyl, in which the saturated or an unsaturated hydrocarbon chain is optionally interrupted by O, S, NR, CO, C(NR), N(R)SO<sub>2</sub>, SO<sub>2</sub>N(R), N(R)C(O)O, OC(O)N(R), N(R)C(O)N(R), OC(O), C(O)O, OSO<sub>2</sub>, SO<sub>2</sub>O, or OC(O)O, where R

may be independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>) alkyl, (C<sub>1</sub>-C<sub>10</sub>) alkenyl, (C<sub>1</sub>-C<sub>10</sub>) alkynyl, (C<sub>1</sub>-C<sub>10</sub>) alkoxy, (C<sub>1</sub>-C<sub>10</sub>) hydroxylalkyl, hydroxyl, (C<sub>1</sub>-C<sub>10</sub>) halolalkyl, where each of the saturated or unsaturated hydrocarbon chains may be optionally substituted with (C<sub>1</sub>-C<sub>10</sub>) alkyl, (C<sub>1</sub>-C<sub>10</sub>) alkenyl, (C<sub>1</sub>-C<sub>10</sub>) alkynyl, (C<sub>1</sub>-C<sub>10</sub>) alkoxy, hydroxyl, hydroxyl, (C<sub>1</sub>-C<sub>10</sub>) hydroxylalkyl, halo, (C<sub>1</sub>-C<sub>10</sub>) haloalkyl, amino, (C<sub>1</sub>-C<sub>10</sub>) alkylcarbonyloxy, (C<sub>1</sub>-C<sub>10</sub>) alkoxycarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylcarbonyl, (C<sub>1</sub>-C<sub>10</sub>) alkylsulfonylamino, aminosulfonyl, or (C<sub>1</sub>-C<sub>10</sub>) alkylsulfonyl,

or R<sup>2</sup> and R<sup>3</sup> optionally form a (C<sub>6</sub> or C<sub>10</sub>) aryl, (C<sub>6</sub> or C<sub>10</sub>) arylalkyl, (C<sub>6</sub> or C<sub>10</sub>) heteroaryl, (C<sub>3</sub>-C<sub>8</sub>) heterocycloalkenyl, (C<sub>5</sub>-C<sub>8</sub>) cycloalkene ring, (C<sub>5</sub>-C<sub>8</sub>) cycloalkyl, (C<sub>5</sub>-C<sub>8</sub>) heterocycloalkyl linked or fused ring system, optionally containing up to 3 heteroatoms, e.g. oxygen, nitrogen, sulphur or phosphorous.

or R<sup>1</sup> and R<sup>2</sup> optionally form a (C<sub>6</sub> or C<sub>10</sub>) aryl, (C<sub>6</sub> or C<sub>10</sub>) arylalkyl, (C<sub>6</sub> or C<sub>10</sub>) heteroaryl, (C<sub>3</sub>-C<sub>8</sub>) heterocycloalkenyl, (C<sub>5</sub>-C<sub>8</sub>) cycloalkene ring, (C<sub>5</sub>-C<sub>8</sub>) cycloalkyl, (C<sub>5</sub>-C<sub>8</sub>) heterocycloalkyl linked or fused ring system, optionally the ring formed may be further substituted with a group R<sup>1</sup> as defined above, or the ring formed may be fused to a further C<sub>6</sub> aryl group which may be optionally substituted with a group R<sup>1</sup> as defined above, or a group R<sup>1</sup>R<sup>2</sup>N, with R<sup>1</sup> and R<sup>2</sup> as defined above,

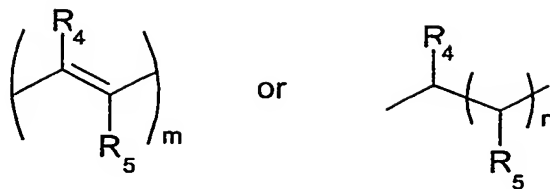
n may be equal to 0, 1 or 2,

X may be hydroxyl (-OH), -OR, NHR, hydroxamate (-NHOH), NHOR, NROR, NRNHR, or SR

where each group R may independently be hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl or substituted C<sub>1</sub>-C<sub>6</sub> alkyl, and

Y may be 0, 1 or 2 oxygen atoms, or NR where R may be H, OH, OR or a carbon atom, where R may be C<sub>1</sub>-C<sub>6</sub> alkyl or substituted C<sub>1</sub>-C<sub>6</sub> alkyl.

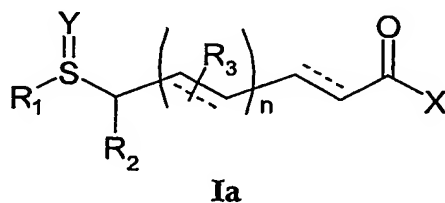
Q represents



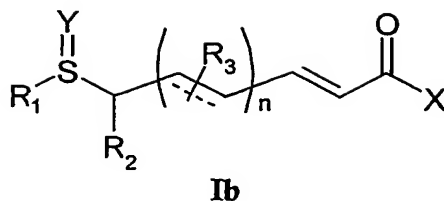
wherein m is an integer from 1 to 4; n is an integer from 1 to 8; and R<sup>4</sup> and R<sup>5</sup> each independently represents hydrogen, unsubstituted or substituted C<sub>1</sub>-C<sub>10</sub> alkyl, an  
 5 unsaturated hydrocarbon chain of up to ten carbon atoms comprising one or more carbon-carbon double bonds, C<sub>6</sub> or C<sub>10</sub> aryl, a 5- to 10-membered heterocyclic group, C<sub>1</sub>-C<sub>10</sub> alkoxy, C<sub>1</sub>-C<sub>10</sub> thioalkoxy, hydroxyl, halo, cyano, nitro, amino, amido, (C<sub>1</sub>-C<sub>10</sub> alkyl)carbonyloxy, (C<sub>1</sub>-C<sub>10</sub> alkoxy)carbonyl, (C<sub>1</sub>-C<sub>10</sub> alkyl)carbonyl, (C<sub>1</sub>-C<sub>10</sub> alkyl)thiocarbonyl, (C<sub>1</sub>-C<sub>10</sub> alkyl)sulfonylamino, aminosulfonyl, C<sub>1</sub>-C<sub>10</sub> alkylsulfinyl,  
 10 C<sub>1</sub>-C<sub>10</sub> alkylsulfonyl, or a saturated or unsaturated C<sub>3</sub>-C<sub>12</sub> hydrocarbon chain interrupted by O, S, NR, CO, C(NR), N(R)SO<sub>2</sub>, SO<sub>2</sub>N(R), N(R)C(O)O, OC(O)N(R), N(R)C(O)N(R), OC(O), C(O)O, OSO<sub>2</sub>, SO<sub>2</sub>O or OC(O)O where R is as defined above and the saturated or unsaturated hydrocarbon chain is optionally substituted as defined above;  
 15 or a pharmaceutically acceptable salt thereof.

2. A compound as claimed in claim 1, in which the compounds are of general formula (I) have the formula (Ia)

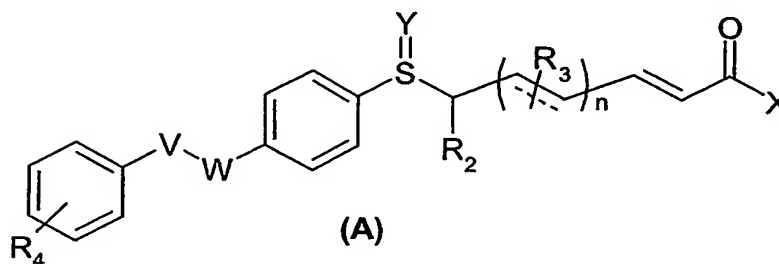
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3. A compound as claimed in claim 1, in which the compounds are of general formula (Ib)



4. A compound of claim 1, in which the compounds are of general formula (A)



in which V and W are as follows:

a single carbon-carbon bond ,

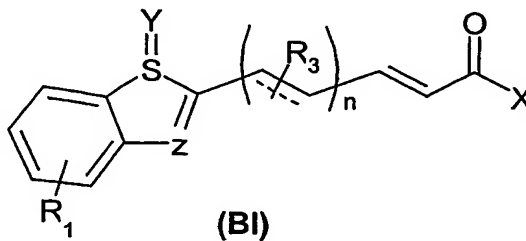
V is CR and W is N, saturated or unsaturated

V is N and W is CR, saturated or unsaturated

a linkage of the form VW or WV = RRC-O or RRC-S.

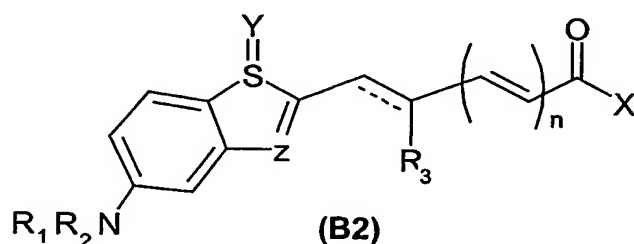
wherein V and/or W may be optionally substituted (C<sub>1</sub>-C<sub>6</sub>) alkyl, C<sub>6</sub> aryl or heterocycle, and in which each group R is independently defined.

5. A compound of claim 1, in which the compounds are of general formula (BI)



in which n is equal to zero, one or two, and Z is a two-atom linkage of varying combinations of atoms of C, O, N, S, SO, SO<sub>2</sub>, and in which each group R is independently defined.

6. A compound of claim 1, in which the compounds are of general formula (B2)

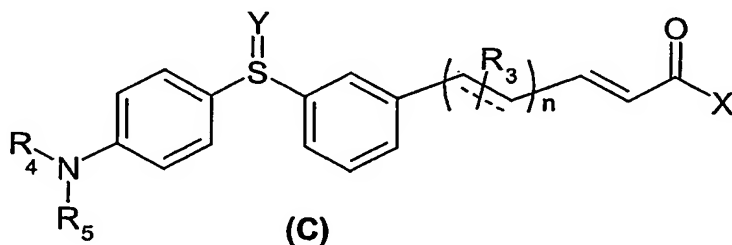


in which n is equal to zero, one or two, Y is no atom present, O or O<sub>2</sub> or NR and Z = CR or N; or

in which n is equal to zero, one or two and X = NHOH, OH, NROR, CRROH;

and Z is a one atom linkage of N or C, or a two-atom linkage of varying combinations of atoms of C, O, N, S, SO, SO<sub>2</sub>, and in which each group R is independently defined.

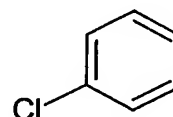
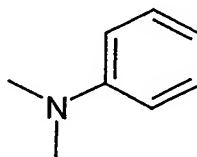
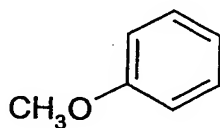
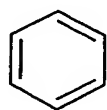
7. A compound of claim 1, in which the compounds are of general formula (C)



in which Y is equal to no atom, O or O<sub>2</sub> or NR and n is equal to zero, one or two and X is equal to NHOH, OH, NROR, CRROH, and in which each group R is independently defined.

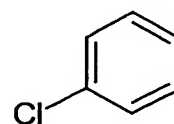
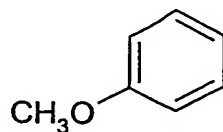
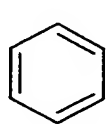
- 5      8.      A compound as claimed in claim 1, in which R<sup>2</sup> and R<sup>3</sup> are both Hydrogen.
9.      A compound as claimed in claim 1, in which R<sup>2</sup> is methyl (CH<sub>3</sub>) and R<sup>3</sup> is Hydrogen.
- 10     10.     A compound as claimed in claim 1, in which R<sup>2</sup> is Hydrogen and R<sup>3</sup> is methyl (CH<sub>3</sub>).
11.     A compound as claimed in claim 1, in which R<sup>2</sup> and R<sup>3</sup> are both methyl (CH<sub>3</sub>).
- 15     12.     A compound as claimed in claim 1, in which R<sup>1</sup> is (C<sub>6</sub> or C<sub>10</sub>) aryl, optionally substituted by halo, (C<sub>1</sub>-C<sub>10</sub>) alkoxy, or by (C<sub>1</sub>-C<sub>10</sub>) alkylamino.
13.     A compound as claimed in claim 1, in which X is -OH, -OC<sub>2</sub>H<sub>5</sub>, -OCH<sub>3</sub>, or NHOH.
- 20     14.     A compound as claimed in claim 1, in which Y is represented by one or two oxygen atoms.
15.     A compound as claimed in claim 1, in which R<sup>2</sup> and R<sup>3</sup> are both Hydrogen (H), Y is equal to zero oxygen atoms, and n is equal to 1, R<sup>1</sup> is one of

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and X is one of -OH, -OCH<sub>3</sub>, -OC<sub>2</sub>H<sub>5</sub> or NHOH.

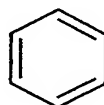
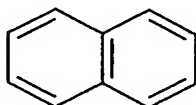
16. A compound as claimed in claim 1, in which  $R^2$  and  $R^3$  are both Hydrogen (H), Y is equal to one oxygen atom, and n is equal to 1,  $R^1$  is one of



and X is one of -OH, -CH<sub>3</sub>, -OC<sub>2</sub>H<sub>5</sub> or NHOH.

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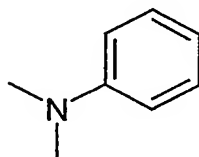
17. A compound as claimed in claim 1, in which  $R^2$  and  $R^3$  are both Hydrogen (H), Y is equal to two oxygen atoms and n is equal to 1,  $R^1$  is one of



and X is one of -OH, -CH<sub>3</sub>, -OC<sub>2</sub>H<sub>5</sub> or NHOH.

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18. A compound as claimed in claim 1, in which  $R^2$  and  $R^3$  are both methyl (CH<sub>3</sub>), Y is equal to zero oxygen atoms, and n is equal to zero,  $R^1$  is



15 and X may be -OCH<sub>3</sub>, -OC<sub>2</sub>H<sub>5</sub> or -OH.

19. A compound as claimed in claim 1 which is:

6-Phenylsulfanyl-hexa-2,4-dienoic acid (6a)

20 6-(4-Chloro-phenylsulfanyl)-hexa-2,4-dienoic acid methyl ester (6b)

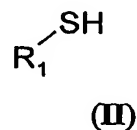
6-Phenylsulfanyl-hexa-2,4-dienoic acid methyl ester (6c)

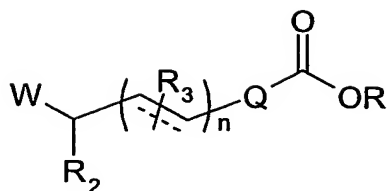
6-(4-Dimethylamino-phenylsulfanyl)-hexa-2,4-dienoic acid methyl ester (6d)

- 6-(4-Methoxy-phenylsulfanyl)-hexa-2,4-dienoic acid methyl ester (6e)  
6-(4-Chloro-phenylsulfanyl)-hexa-2,4-dienoic acid hydroxyamide (7b)  
6-(4-Dimethylamino-phenylsulfanyl)-hexa-2,4-dienoic acid hydroxyamide (7c)  
6-Phenylsulfinyl-hexa-2,4-dienoic acid methyl ester (8a)  
5 6-(4-Chloro-benzenesulfinyl)-hexa-2,4-dienoic acid methyl ester (8b)  
6-(4-Methoxy-benzenesulfinyl)-hexa-2,4-dienoic acid methyl ester (8c)  
6-Benzenesulfinyl-hexa-2,4-dienoic acid (8d)  
6-(4-Chloro-benzenesulfinyl)-hexa-2,4-dienoic acid hydroxyamide (9a)
- 10 6-(4-Methoxy-benzenesulfinyl)-hexa-2,4-dienoic acid hydroxyamide (9b)  
6-Benzenesulfonyl-hexa-2,4-dienoic acid (10a)  
6-Benzenesulfonyl-hexa-2,4-dienoic acid methyl ester (10b)  
6-Benzenesulfonyl-hexa-2,4-dienoic acid hydroxyamide (11a)  
6-(Naphthalen-2-ylsulfanyl)-hexa-2,4-dienoic acid methyl ester (13b)  
15 6-(Naphthalen-2-ylsulfanyl)-hexa-2,4-dienoic acid hydroxyamide (14a)  
4-(4-Dimethylamino-phenylsulfanyl)-2-methyl-pent-2-enoic acid methyl ester (21b)  
6-(4-Dimethylamino-phenylsulfanyl)-4-methyl-hepta-2,4-dienoic acid ethyl ester  
(24c)  
6-(4-Dimethylamino-phenylsulfanyl)-4-methyl-hepta-2,4-dienoic acid hydroxyamide  
20 (25c)  
6-(4-Chloro-phenylsulfanyl)-hexanoic acid methyl ester (28b)  
7-(4-Chloro-phenylsulfanyl)-heptanoic acid ethyl ester (28c)  
6-(4-Amino-phenylsulfanyl)-hexanoic acid methyl ester (28d)  
6-(4-Dimethylamino-phenylsulfanyl)-hexanoic acid methyl ester (28e)  
25 6-(4-((4-Chlorobenzyl)-methylamino)-phenylsulfanyl)-hexanoic acid methyl ester  
(28f)  
6-(4-(4-Chlorobenzenesulfonylamino)-phenylsulfanyl)-hexanoic acid methyl ester  
(28g)  
6-(4-Bromo-phenylsulfanyl)-hexanoic acid methyl ester (28h)  
30 6-(4'-Chloro-biphenyl-4-ylsulfanyl)-hexanoic acid methyl ester (28i)  
6-(4-Chloro-phenylsulfanyl)-hexanoic acid hydroxyamide (29b)  
6-(4-Dimethylamino-phenylsulfanyl)-hexanoic acid hydroxamide (29c)



- 6-(4-(4-Chlorobenzenesulfonylamino)-phenylsulfanyl)-hexanoic acid hydroxamide (29g)
- 6-(4'-Chloro-biphenyl-4-ylsulfanyl)-hexanoic acid hydroxamide (29i)
- 6-(4-Chloro-benzenesulfinyl)-hexanoic acid methyl ester (30b)
- 5 7-(4-Chloro-benzenesulfinyl)-heptanoic acid ethyl ester (30c)
- 6-(4-Dimethylamino-benzenesulfinyl)-hexanoic acid methyl ester (30e)
- 6-(4-((4-Chlorobenzyl)-methylamino)-benzenesulfinyl)-hexanoic acid methyl ester (30f)
- 6-(4'-Chloro-biphenyl-4-ylsulfinyl)-hexanoic acid methyl ester (30i)
- 10 6-(4-Chloro-benzenesulfinyl)-hexanoic acid hydroxyamide (31a)
- 7-(4-Chloro-benzenesulfinyl)-heptanoic acid hydroxyamide (31c)
- 6-(4-Dimethylamino-benzenesulfinyl)-hexanoic acid hydroxyamide (31e)
- 6-(4-((4-Chlorobenzyl)-methylamino)-benzenesulfinyl)-hexanoic acid hydroxamide (31f)
- 15 6-(4'-Chloro-biphenyl-4-sulfinyl)-hexanoic acid hydroxyamide (31i)
- (2E,4E)-5-(5-Dimethylamino-benzo[*b*]thiophen-2-yl)-penta-2,4-dienoic acid ethyl ester (41a)
- (2E,4E)-5-(5-Dimethylaminobenzo[*b*]thiophen-2-yl)-penta-2,4-dienoic acid hydroxamide (42a)
- 20 (E)-3-(3-(4-Dimethylamino-phenylsulfanyl)-phenyl)-acrylic acid ethyl ester (51a)
- (E)-3-(3-(4-Dimethylamino-phenylsulfanyl)-phenyl)-*N*-hydroxy-acrylamide (52a)
20. 4-(4-Dimethylamino-phenylsulfanyl)-2-methyl- pent-2-en-1-ol (22b)
- 25 21. A process for the preparation of a compound of general formula (I), comprising the addition of a compound of general formula (II) to general formula (III),

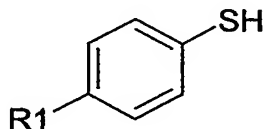




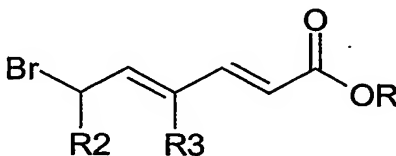
(III)

optionally followed by hydrolysis, or oxidation then hydrolysis, where W is a leaving group.

22. A process as claimed in claim 21, in which the compound of general formula (II) is a compound of general formula (5) and the compound of general formula (III) is a compound of general formula (4),



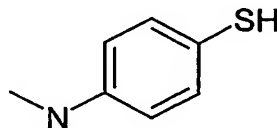
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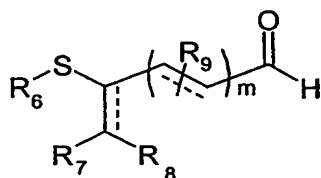
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optionally followed by hydrolysis, or oxidation then hydrolysis.

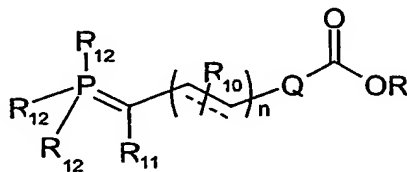
23. A process as claimed in claim 21, in which the compound of general formula (II) is a compound of general formula (20) and the compound of general formula (III) is a compound of general formula (17),



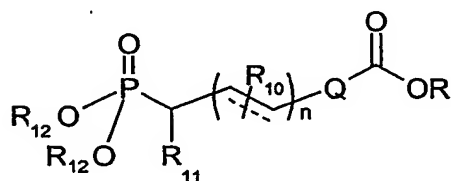
26. A process for the preparation of a compound of general formula (I),  
comprising the addition of a compound of general formula (IV) to general formula  
5 (Va) or (Vb),



(IV)



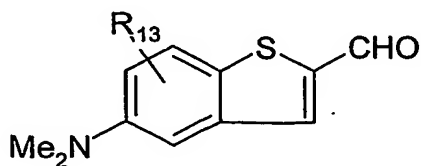
(Va)



(Vb)

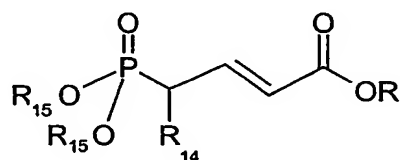
optionally followed by hydrolysis, or oxidation then hydrolysis.

27. A process as claimed in claim 26, in which the compound of general formula  
(IV) is a compound of general formula (39), and the compound of general formula  
(Vb) is a compound of general formula (40)



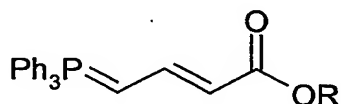
optionally followed by hydrolysis, or oxidation then hydrolysis.

- 5 28. A process as claimed in claim 26, in which the compound of general formula (IV) is a compound of general formula (49) oxidised to the corresponding aldehyde,



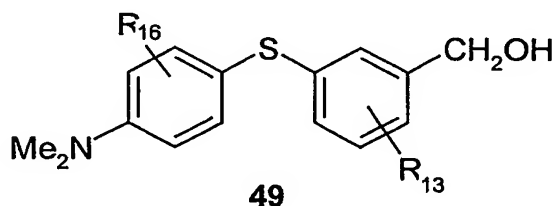
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and the compound of general formula (Va) is a compound of general formula (50)



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optionally followed by hydrolysis, or oxidation then hydrolysis.

- 15 29. A pharmaceutical composition comprising a compound of general formula (I) as defined in any preceding claim, and optionally a pharmaceutically acceptable adjuvant and/or diluent.

- 20 30. A compound of general formula (I) as defined in any preceding claim for use in medicine.

31. A method of treatment of an individual suffering from a disease condition, the method comprising administering to the individual a therapeutically effective amount of a compound of general formula (I) as defined in any preceding claim.

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32. A method of inhibition of histone deacetylase activity in an individual suffering from a disease condition, the method comprising administering to the individual a therapeutically effective amount of a compound of general formula (I) as defined in any preceding claim.

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33. The use of a compound of general formula (I) as defined in any preceding claim in the manufacture of a medicament for the treatment of cancer, including breast cancer, colon cancer, colorectal cancer, esophageal cancer, glioma, lung small and non-small cell cancers, leukaemia neuroblastoma, prostate cancer, thoracic cancer, melanoma, ovarian cancer, cervical cancer and renal cancer; cardiac hypertrophy, as well as haematological disorders including hemoglobinopathies, thalassaemia, and sickle cell anemia, auto-immune diseases, such as arthritis, Huntington's disease, and neurological conditions, such as Alzheimer's disease, and genetic-related metabolic disorders, such as cystic fibrosis, peroxisome biogenesis disorders, adrenoleukodystrophy, stimulating hematopoietic cells *ex vivo*, ameliorating protozoal parasitic infection, accelerating wound healing and protecting hair follicles.

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